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MAGIC LANTERN ANNUAL

EDITED BY J. HAY TAYLOR.

# THE OPTICAL MAGIC LANTERN

## JOURNAL

### And Photographic Enlarger.

A Magazine of Popular Science for the Lecture-Room and the Domestic Circle.

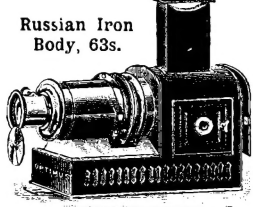
WITH WHICH IS INCORPORATED THE "LANTERN WORLD."

Vol. 10.—No. 119.

APRIL, 1899.

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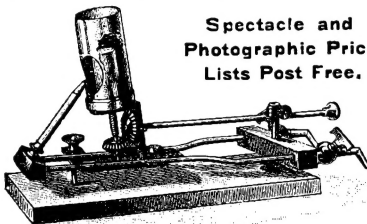
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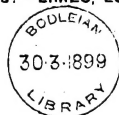
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Vol. 10.—No. 119.

APRIL, 1899.

Price 2d., Post-free 3d.

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NOTICES.

THE *Optical Magic Lantern Journal and Photographic Enlarger* is issued on the 1st of every month, price Two Pence, and may be obtained from all Newsvendors, Railway News Stalls, Photographic Dealers, or from the Publishers, at the following rates, post free:—

12 months, 3/- United States, 75 cents.

EXCHANGE Column, General Wants, &c. (not Trade)—First 20 words, 6d.; and for every 3 additional words, 1d.

SMALL ADVERTISEMENTS must reach the office not later than the first post on the 24th of each month. All cheques and postal orders to be made payable to the Magic Lantern Journal Company, Limited.

EDITORIAL communications must be addressed, J. HAY TAYLOR, Advertisements and business communications to THE MAGIC LANTERN JOURNAL COMPANY, Limited, 9, Carthusian Street, London. E.C.

American Agents:—The International News Co., 83 and 85, Duane Street, New York City.



**Acetylene Gas Exhibition.**—From May 14th to 28th, an exhibition of acetylene gas and its belongings will be held at Budapest. The exhibition will consist of two sections—Manufacture of calcium carbide and acetylene lighting.

**One Penny a Pound.**—Owing to certain alleged discoveries on the part of Prof. Prenner, it is claimed that by the adoption of his method of manufacture, calcium carbide can be sold at one penny a pound. Up to the present no details as to the methods of manufacture have come to hand.

**Cinematograph Fire.**—On the 4th ult. at a Hammersmith Theatre the film for the cinematograph became ignited, but being enclosed in the fireproof room designed by the London County Council, even those in close proximity were unaware of any mishap. Unfortunately the operator was rather severely burned, and the show had to be postponed.

**A Correction.**—By an oversight last month in the foot-note in connection with the article on "Animated Photography," page 38, the name *Photo. Times* was printed instead of *Photo. Dealer*.

**Chemistry for Photographers.**—The second edition of this book, by Mr. C. F. Townsend, F.C.S., F.R.P.S., has been issued by Dawbarn & Ward, Limited, at ls.

**Removal.**—Mr. Chatham Pexton has just removed from his upstairs premises at 22, Gray's Inn Road, London, to 368, Gray's Inn Road. At the latter place he has a fine shop front, and adjoins the Metropolitan Railway Station at King's Cross. The large window contains an assortment of lantern apparatus and an excellent show of lantern slides both plain and coloured.

**Cinematograph and Fire Brigade**—To Mr. J. B. Medland, of 13, York Street, Walworth, fell the honour of giving a cinematographic exhibition at the Central Fire Brigade Station, S.E., last week, and, at the same time, to exhibit the actual working of such machines. The particular instrument exhibited—the Vit-Autoscope—was of his own invention, which has done excellent work on numerous occasions. Mr. Medland and his apparatus were brought to the place of exhibition in royal style by the brigade. The exhibition and demonstration was a big success, and the great so-called dangers of the cinematograph were pointed out by Mr. Medland in his well-known and forcible style.

**A Lantern Breakdown.**—On the 16th ult. the audience were waiting for the commencement of a lecture at West Ham, under the auspices of the Liberal Association. The lantern was not ready and several persons assisted to erect the screen, which occasionally came in contact with the gas fixtures. Meantime pianoforte solos filled up the wait until the lantern was ready. All would have then gone well, but unfortunately, after a few pictures had been projected, the rubber tubing was blown off the cylinder connections and the cylinder speedily emptied its contents into the atmosphere, thus bringing the exhibition to a speedy close. An interesting lecture was given without the lantern, and with some good instrumental and vocal music the audience enjoyed themselves.

## A Cinematographic Camera, Printer, Projector, and Snapshot Camera in one.

### THE BIOKAM.



HE letters K or X seem to be getting into general use in connection with the naming of photographic and lantern apparatus, and the latest apparatus termed the Biokam is no exception. What then is the Biokam? It is a neat and compact cinematographic camera, transparency printer, projector, and snapshot camera all included in one instrument.

The complete apparatus measures only  $3\frac{1}{4}$  by  $5\frac{1}{2}$  by  $9\frac{1}{2}$  inches, and weighs when fully charged  $2\frac{1}{2}$  lbs. It is provided with two small but superior lenses by Voigtlander, one for taking negatives and the other for projection purposes, the latter having a focus of  $1\frac{1}{2}$  inches. These two lenses are mounted in cylinders and fit into the same jacket.

Pictures taken by this instrument are necessarily small and measure  $\frac{1}{2}$  by  $\frac{1}{2}$  of an inch, but are particularly clear and well defined, and can be projected to several square feet in size without deterioration. The instrument is, we may say, intended to meet the wants of amateurs, and this we think it certainly does. In addition to its use as a cinematographic outfit it can also be used as a snapshot camera for individual pictures, or, if desired, time exposures may be made, so completely has



Fig. I.

everything been arranged. We reproduce, Fig. I., a piece of a film exposed with this instrument, although the greater part of the detail will be lost in the making of the block and the printing, but it will serve to show the size and also the method of perforation whereby the film is carried forward for successive exposures, the perforations falling with great exactitude in the centre of the line of demarcation between each picture.

The woodwork of this instrument is mahogany ebonised, and when secured to a tripod ready for exposure presents itself as we see it in Fig. II. In the drum attached at top, and several

**GENERAL ADVERTISEMENTS.**

**A** PROFESSIONAL lanternist and cinematographist of great experience is open to engagements, with or without his own apparatus, in town or country, on very moderate terms. Reference, Editor of this Journal.—Address, Optics, 13, York-street, Walworth, London.

**E**FFECT slides painted to order, from 3 inch to 10 inch or 12 inch diameter, for high-class diorama exhibitions; hand-painted and coloured photos also made from owner's negatives and drawings, etc.; list of standard effects 1d, free.—Wilkinson & Co., Slide Makers, Wholesale Opticians, Sunderland

**B**ARGAINS; clearing out; 200 full size lantern slides, B comics, Scripture, etc. only £3 15s.—Fred Terry, 40, Landcroft-road, London, S E

**70** BOTANICAL slides, with reading, two magic mirrors (convex, concave), exchange; wanted, London, flowers, effects, etc.—Heaton, West-street, Blackpool.

**M**AHOGANY bi-umal, Meniscus, with 8 inch objectives, condensers, jets, 15 feet sheet, travelling case, in use up to 29th; only £3 10s.—Lanternist, 17, Thorpe-road, Forest Gate, E.

**A**CETYLENE generator, Abingdon safety, 9 inch, and Moss lantern jet.—W. B. C., Billingshurst, Sussex.

**P**ROFESSOR BATE, lanternist and cinematographist for home or abroad; fakes and effects, copyright—67, Wellington-street, Bradford, Manchester.

**G**RAND new effect sets in exquisite hand work; many new and original subjects and novelties, unique and unequalled; send for lists.—Edmund H. Wilkie, as below.

**S**INGLE lantern effects; the whole of the movements and changes on one slide, producing effects hitherto impossible in single lanterns; a great novelty; invariably give the greatest satisfaction; send for special list.—Edmund H. Wilkie, as below.

**E**VERY class of photograph colouring with special atmospheric effects, equal to hand painting; artistic work of the highest excellence; hand paintings from any copy or written description; photographic slides prepared from snapshot negatives of any size; send for list of effects.—Edmund H. Wilkie, as below.

**O**RIGINAL mechanical and dissolving effects a speciality; reproductions of the grand effects as exhibited at the late Royal Polytechnic Institution on any scale; novelties in the finest work for advertising purposes, lecturers, theatrical exhibitors, or scientific demonstrations.—Edmund H. Wilkie, as below.

**A** BOON to lanternists.—To produce the best results on the screen use only Wilkie's Solar flint limes; these are made with the greatest care from the hardest lime in the world, and produce an intensely concentrated pure white light of immense penetrative power; in airtight tins, containing one dozen, 2s. 9d., post free; special large size, a magnificent lime, in tins of six limes, 2s. 3d., post free; after using these superb limes lanternists will never be content with any other; unequalled for cinematographic work.—Edmund H. Wilkie, as below.

**D**URING the bright, long summer days the finest painted work is produced; do not delay your orders until the next lantern season commences.—Edmund H. Wilkie, 114, Maygrove-road, West Hampstead, London, N.W.

**F**OR sale, 20 feet screen with stand; brand new, never even been used; cost £6 19s.; what offers?—Apply to Executors, c/o John Thomasson & Son, Bolton.

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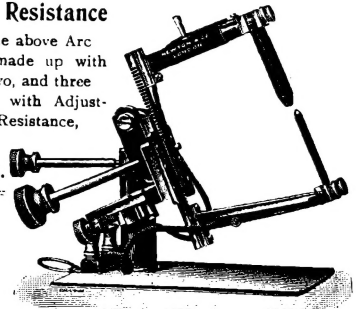
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FOR sale, Kiteagraph with Darlot combination lens; also films, new and perfect, five 40 feet, six 80 feet; also announcement slides for same, lantern, etc., if required; what offers?—Fildes, Greenodd, Ulverston.

FOR triple lantern.—One pair Docwra regulators (Hughes' patent) in good condition, £1 15s.—W. M. Baynes, Braganza, Torquay.

WANTED, first-class mahogany or iron lantern (Terpence's preferred) for oil light; fullest particulars, maker, condition; also slides of London.—Turney, Shercock, Carrickmacross.

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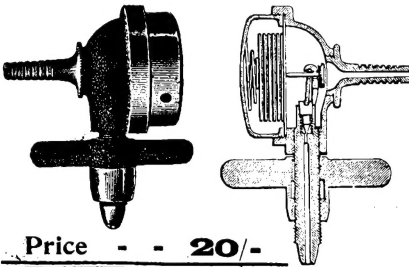
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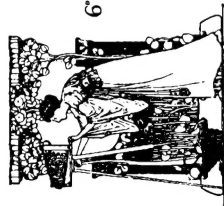
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of these drums can be conveniently carried in one's pocket, the sensitive film is contained. When attaching one of these drums holding sufficient film for about 700 exposures, a small length of the film is withdrawn, the drum slipped into place, and the hinged portion opened as in Fig. III.

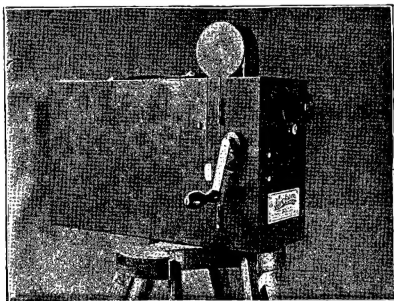


Fig. II.

It will then be seen that that portion of the film withdrawn is finely ground, and is not coated with sensitised material: this is passed in front of the lens and inserted into a slot and the apparatus closed. By sliding open a slot in the rear and looking through, this small piece of

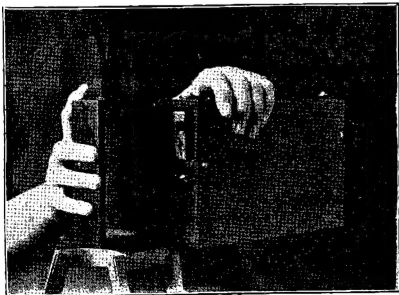


Fig. III.

film will be found to act the part of a ground glass on which the picture can be focused accordingly. It then suffices to turn the handle, when at each turn nine cinematographic exposures are made. Provision is made for the rapid interchange of films merely by attaching a second drum, detaching the mechanism portion

as in Fig. IV. and attaching the other end of the body, which is divided longitudinally into two compartments. When these two compartments are filled they can be quickly emptied by opening the side of the drum, attaching thereto the end of film seen in last figure to be protruding, holding the drum (lid closed) to the



Fig. IV.

light trapped opening, turning the winch handle with which it is provided, and by this means rewinding it into the drum. This, we may say, is all done in less time than it takes to describe.

For printing transparencies from the negatives a special receptacle is supplied with the apparatus. This holds two films, the negative and sensitised film, which pass in contact

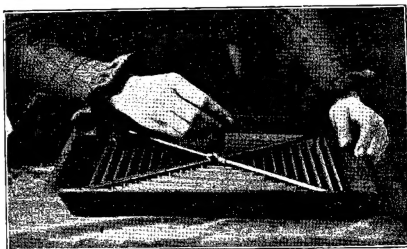


Fig. V.

at the lens hole; the sensitised film passing into the body in the manner spoken of when taking negatives, and the negative film going straight down into a basket or box held below. Films so exposed can be readily developed by the amateur with a developing outfit supplied by the makers. This merely consists of a dish

and cross-frame with projecting pegs, upon which the film is wound, as shown at Fig. V.

Referring to Fig. II., it will be seen that there are two spindles, to which the handle may be attached. The top pivot is used when making transparencies, each revolution of the handle then giving one picture or exposure. (In Fig. II. the handle happens to be on the wrong pivot, for taking negatives it should be on the lower one.)

In Fig. IV. the mechanism portion of the apparatus is shown detached. This detached portion is secured (by attachments procurable) to the front O.G. of any lantern, and in this manner we have a firmly secured projecting apparatus.

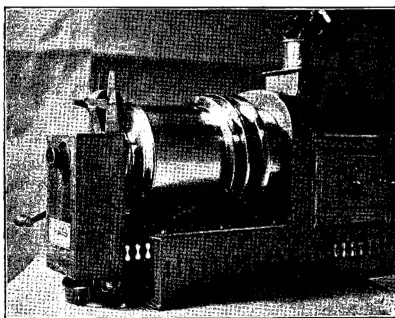


Fig. VI.

We have carefully examined the apparatus in question, and must say that everything is well and thoroughly made, and that with it one can take cinematographic pictures, print transparencies from same, and project the results—supposing that the user has an ordinary lantern—in an exceedingly interesting manner. The complete apparatus may be obtained for the outlay of six guineas, excluding the cross-frame for developing, which would be a small item.

This outfit, which marks an era in lanternism, may be obtained from any lantern dealer, and the credit for its production must be given to two prominent firms in the lantern world, who have in connection with the introduction and manufacture of this instrument joined issues, viz., Messrs. John Wrench & Son, of 50, Gray's Inn Road, W.C., and the Warwick Trading Company, of 4 & 5, Warwick Court, Holborn, W.C. Without doubt the above

outfit is the finest thing brought out for the benefit of amateur lanternists for many years, and we hope that the two firms mentioned will meet with their just reward.

We may say that the issue of this apparatus has been held over until the 15th inst., when about 2,000 will be ready for sale, and about 100 per week after. These may be obtained from any retail dealer. Our experiments were tried with a finished working model, but we have lodged our application to come in with the first allotment of machines.

For those who merely wish to have the projector portion, it is to be cased in polished mahogany ready for attaching to any lantern in place of the ordinary projection lens, as in Fig. VI.



### Optical and Mechanical Effects for the Lantern.—No. VIII.

By EDMUND H. WILKIE.  
(LATE ROYAL POLYTECHNIC INSTITUTION.)

SOMETIMES it is desirable in lantern effects to sink a ship, the hull of which is darker than the water upon which it floats, in which case it is impossible to throw it on from a second lantern in the way we explained in a former letter; but one method of dealing with a dark body on a lighter ground can be gathered from the following effect:—

The picture represents a number of ironclads anchored in a bay or harbour, and being appre-

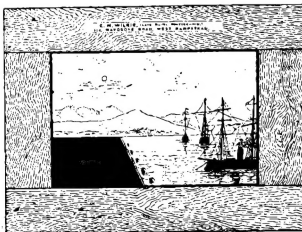


Fig. XXV.

hensive of a night attack, the usual precautions in use in time of war are adopted. To prevent sudden onslaughts by torpedo boats, a number of spars or booms are lashed together by iron chains and form a cordon round the fleet, being kept in their places by means of a number of



buoys, which are firmly anchored in their places. It will be seen that the picture is not complete, the space beyond the barrier of spars being opaque black. To finish our picture it is necessary, therefore, to throw on from another lantern a second slide, such as we see at Fig. XXVI., which represents the missing corner only, and is carefully painted to match the main view both in form and colour.

When these are both on the screen the view is complete, and it is necessary to use care in the adjustment of the lights in order that one portion shall not be brighter than another, and thus render the join visible. It will be seen from our diagram that slide number two (Fig. XXVI.) has two slips of glass moved by the two handles at the end of the frame, one of them being drawn out previously to inserting the slide in the lantern. On this slip is painted in dark colours a torpedo launch armed with a spar torpedo, which its crew hope to fire against the hull of one of the enemy's warships; but in this case they have clearly reckoned without their host, for the ships are protected by the barrier of spars lashed together, against which they dash in the darkness, causing sufficient disturbance to attract the attention of the vigilant A.B.'s on the watch, who immediately fire a gun (the flash is caused by slip number two on the same slide), the effect of which is made apparent by flashing on Fig. XXVII. and taking off Fig. XXVI. at the same time.

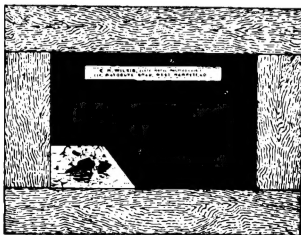


Fig. XXVI.

The biter is bitten, and they are completely wrecked. Iron, though a valuable tonic in most cases, is not desirable when abruptly presented in such large doses.

In this case we see how portions of pictures may be filled in and caused to change without disturbing the main body of the view, and this principle being a valuable one and extremely useful in many cases, we may perhaps have to refer to it again at a future time.

Most of the effect sets illustrating the destruction of vessels by torpedoes are to be recommended to those exhibitors who go in for essentially popular exhibitions, as the movements are interesting, the effects are certainly striking, and the colouring very vivid, but it may be remarked in passing that it is not always advisable to increase the realism of the scene by the introduction of those loud reports so disturbing to the nerves of quiet old ladies amongst the spectators.

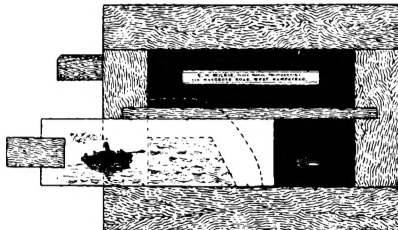


Fig. XXVII.

A very good instrument for use when some kind of crash or explosion is necessary is the old-fashioned policeman's rattle, resembling in its working parts the delightful "scratch-back" that "Arry" playfully rubs down the backs of unoffending trippers on Bank Holidays. This will be found sufficiently harrowing for all ordinary purposes.

An effect showing the destruction of an ironclad by a Whitehead torpedo never fails to rivet the attention of an audience, and is very simple in its parts.

In the opening slide we see the entrance to a harbour, one of the breakwater ends, surmounted by a lighthouse, being just seen on the extreme left, while a large ship of war fills about one third of the circle.

It is moonlight and between the ship and the breakwater the moon's rays form a silvery path, which is of use, as we find presently, in rendering our effect more distinctly visible. From the harbour is seen to emerge a torpedo boat, which, however, does not advance very far into the view, for as soon as it is clearly seen to be well into the circle a fish torpedo leaves its side and traversing the illuminated portion of the sea strikes the ironclad, when a tremendous explosion ensues, the whole picture is filled with flames and smoke, and masses of debris are seen flying through the air. We then see the scene as before, but only a small portion of the vessel is visible above the water, pieces of

jagged hull showing where a moment before the noble vessel floated.

This striking effect is worked by flashing three pictures on to the screen in rapid succession, only the first one possessing a movement of any kind. The ship, sea, and background are of course painted on one glass, but the torpedo boat and the fish torpedo are painted upon two slips working very close together and arranged in such a manner that when both are pulled out together the torpedo is hidden behind the boat, which is then off the picture to the left. Now let us push in these two slips at the same time, both together. The boat appears on the scene bringing the torpedo with it, but the latter is not visible on account of the opaque hull behind which it rests. The boat having reached the required position stops, but not so the torpedo; this having a longer slip continues its journey across the moonlit waters until it reaches the ironclad, when picture No. 2 is flashed on showing the explosion, and after sufficient time has elapsed for this to be plainly seen No. 3 is dissolved on, showing the scene after the explosion. When worked sharply this is a really

#### telling effect,

and possesses no complicated movements to confuse even the most inexperienced operator.

There is one effect built upon a seascape which has no mechanical movement, but is simply dissolved on; it is generally known as "A Ray of Hope," and shows a waterlogged hull without masts drifting at the mercy of the waves in the Bay of Biscay. It bears every evidence of hard usage, the bulwarks being washed away in parts, and the only sign of life is the small figure of a man seen seated astride the bowsprit waving a cloth. Overhead are festoons of dark clouds hanging low in the sky, and the general tenor of the picture is dark and cheerless.

The effect, which is painted on a  $3\frac{1}{4}$  inch glass to register with the picture, represents a flood of light bursting through an opening in the clouds, illuminating a portion of the waters and throwing the wreck into high relief, or sometimes it is treated as a flash of lightning, but when the latter is the case it is also blacked out in portions to leave the hull dark against the blinding glare, or the effect would be lost. The light also appears in a narrow ribbon along the horizon showing up a ship in full sail coming to the rescue, forming an effective and dramatic picture.

## Shadowgram or Silhouette Slides for the Optical Lantern.—No. IV.

By THEODORE BROWN.

**T**O the mechanical shadowgram slides already described, may be added the simple but effective novelty "The Juggler." This slide, which strictly speaking is not of the silhouette class, consists of a figure apparently hitting a ball into the air, and catching it as often as it falls on the end of a stick. By this device three

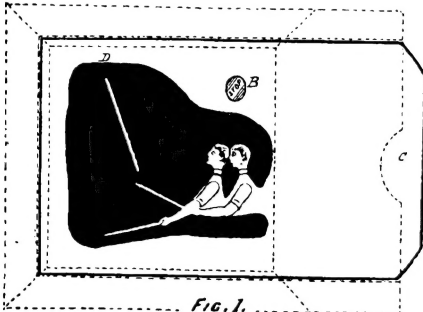


FIG. I.

separate parts of the picture make distinct movements, as the shifting glass c (Fig. I.) is pushed in a horizontal direction either to the right or left.

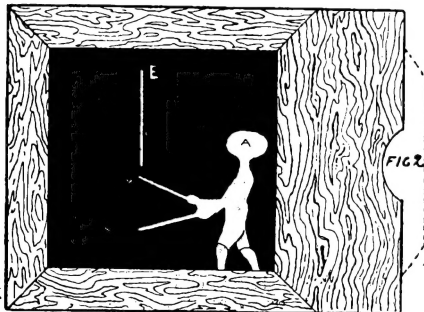


FIG. II.

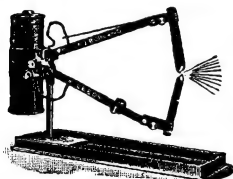
The drawings Figs. I. and II. have been made to scale, so little difficulty will be experienced in finding the correct position for the corresponding of the two drawings. Fig. II. consists of the usual wooden frame, and it is fitted with a piece of glass on which the drawing Fig. II. is made by blocking out the background, and leaving the

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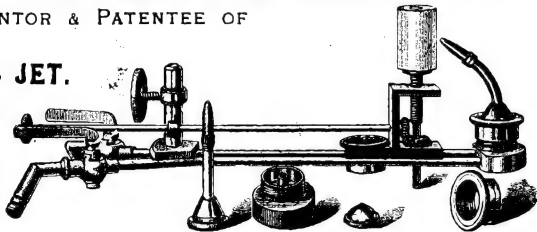
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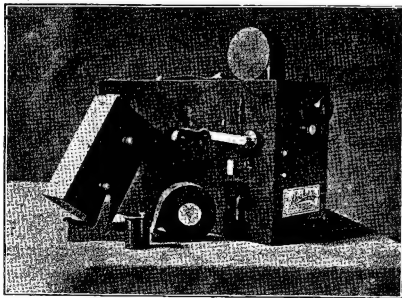
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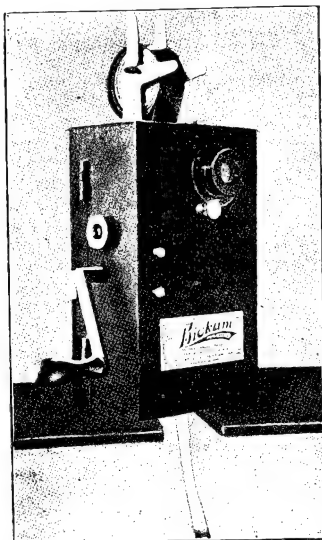
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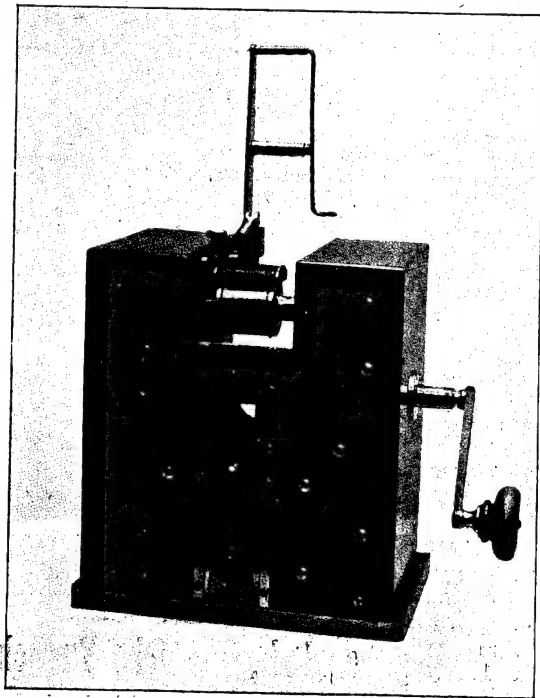
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clear spaces  $\epsilon$  and  $A$ , as shown. The framework is provided with a groove in which a second piece of glass  $c$  (Fig. I.) is placed, having painted on its inner surface the second portion of the picture, as shown in Fig. I.



When this moveable glass  $c$  has been inserted into the frame and properly adjusted, a wooden stop  $B$  (Fig. I.) is glued to the outer surface of the glass in such a position that when the slide  $c$  is drawn out a short distance

this stop may butt against the inside edge of the opening of the framework, and thus limit the play of  $c$  according to the distance it is required to be drawn out.

If both drawings have been properly done, when the complete slide is placed in the lantern a picture (Fig. III.) will be projected on the screen, and on moving the loose slide  $c$  backward and forward the juggler's performance will be effected in a very realistic manner.

When  $c$  is pushed into the framework as far as it will go, the figure will be in the attitude shown in Fig. III., but when withdrawn till the stop  $B$  (Fig. I.) is touching the inside edge of the frame, the attitude of the figure will be just the opposite, *i.e.*, the juggler having his head thrown slightly forward, and in the act of catching the ball on the end of the stick. The reader will have noticed that no ball is actually shown on either of the diagrams employed to bring about this effect, but he will find that by laying the two portions, *i.e.*, the two diagrams together, the clear spaces  $\nu$ , in Fig. I., and  $\epsilon$ , in Fig. II., will cross each other, and on the screen the white spot thus produced will appear like a ball, and the click made by the sliding glass as it stops will pass as the noise made by the ball coming in contact with the juggler's stick.



### Lantern Mnemonics.—No. I.

By JACK-O'-LANTERN.



If everybody remembered all they read, and all they heard, there would be nothing practically for the scribe to do; school boys would enjoy more holidays, school girls would swallow the "cuisine art"

at a gulp, students of science and language would become efficient without study, and very soon we should know so much that all would be a jumble.

No, to master a subject or study takes time, no matter what it is, and it is only by continued drumming and repetition that the memory can in any way retain the knowledge communicated.

This fact has so frequently been made clear in the pages of the OPTICAL MAGIC LANTERN JOURNAL to the members of lanterndom, that they, in common with other students, conclude that to master the catechism of the lantern is a matter of time, a matter of going through its many details over and over again.

With this in view I purpose to just jog the memory of some few facts that should never be forgotten, and that cannot be ignored even by the most proficient.

Always remember that you are responsible for the safety of the public you undertake to entertain, and that every gas accident arises from some cause, which if probed, will be found to have as its base something or other due to carelessness; some also unfortunately through defective apparatus, which an operator cannot foresee. And never forget to make periodical examination of all tackle that in any way is likely to get out of order.

The same cleanliness, so essential in the practice of photography, must be observed in whatever the lanternist does, and will be found economical both to pocket and patience.

Diversity may be given by judicious introduction of advertisement slides into descriptive matter, and much fun has often been infused in this way when a lecture has

#### appeared to flag.

"You will notice," says the lecturer, "Many girls and boys in the foreground of the picture before you, watching the tide come in. May I put a question to them and to you girls and boys I see here? If herrings are made into bloaters, what do Spratts make?" Here is flashed on a slide issued by the firm of Spratts and Company, at the same moment the lecturer calls out "Dogs' biscuits," the audience the while thinking of something wholly different. There are a variety of similar effects to be made from sets issued by such firms as Bird and Son, of custard powder repute; Elliman and Company, embrocation; and many others.

Be sure and never travel without having in the kit a "Ready reference table," by Mr. J. Hay Taylor, a copy of which may be obtained at the office of the MAGIC LANTERN JOURNAL. The operator knowing the focus of his objectives can, by scanning the table, pitch upon the exact spot to place his lantern for the given size of disc he requires. Another handy instrument to carry is the pressure gauge, for

ascertaining the quantity of gas in cylinders. This saves disappointment, which generally occurs at the most inopportune moment.

Bear in mind that a big disc is often a big mistake, and it is found better to use discretion in regulating its size according to the intensity of the light being used. A small or medium sized circle, well lighted and giving a clear picture, is found in practice to be best.

Also be particular that the screen is quite taut, and free from folds and creases, as such give to the picture distortions which it is best without. And remember that the larger the screen the more difficult it is to avoid them.

In thinking out subjects it is pleasant to know that the geography of a city, the altitude of a mountain, the beauties of lake, river, and ocean, can, by means of photography, be reduced to the size of a lantern plate, and then by the aid of the lantern conveyed to thousands of people. Thus, much knowledge is spread.

(To be continued.)



## About Animated Photography.

Continued from page 38.



N the latter case he will do well to so take up his position—if it be possible—that there is no chance that extraneous objects will move right across the camera in a way to obliterate the view during the time that the picture is being taken.

It is difficult to imagine anything more annoying to a photographer when he is photographing, say, the progress of a boat race, than for a steam tug crowded with people to drift just in front of his animated camera as soon as he commences the exposure and remain there all through the race. It is not only the loss of a valuable opportunity which may not occur again that is to be regretted, but every failure in work of this class means a pecuniary loss that is by no means to be despised by the majority of its practitioners. What may be called "made-up" scenes form what is probably the most interesting branch of animated photography for the photographer himself, and where good arrangement and good acting are combined, these little comedies and tragedies in dumb show may be made wonderfully amusing. They must of necessity be somewhat difficult to produce, and from their nature it is probable that no amount of instruction would convey the power to make them successfully. It is surely a case of inherited

aptitude. But we should like to enter a mild protest against the vulgarisation of animated photography which some misguided individuals have thought fit to perpetrate. Any art which seeks to picture nature in an exceptionally naturalistic manner is exceptionally capable of being debased to low uses. Stereoscopic photography, which a short time ago was as popular as is its animated relative of the present time, was peculiarly adapted, by the wonderful appearance of solidity which it gives to the photographs, for perversion to the uses of the unprincipled. It was so perverted and to-day it is dead, practically, though its beautiful and artistic capabilities are as great as, or greater than ever. There is the same possibility in animated photography and there is, unfortunately, the same tendency to make use of it. We trust that it will not be encouraged.

## II.—THE DEVELOPMENT, PRINTING, AND PERFORATION OF FILMS.

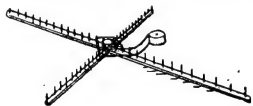
In all cameras for animated photography the unexposed pellicle upon which the series of little pictures is to be produced is tightly wound upon a spool in the upper portion of the instrument. Beneath the apparatus a similar spool is placed, and these two spools are in such communication with the mechanical movement of the apparatus that the turning of the handle which constitutes the exposure actuates both, and the film is wound from one to the other without any trouble to the photographer whatever—always provided that nothing goes wrong with the winding mechanism. Up to this point the film has no terrors for him—except, perhaps, its initial expense. Indeed, he is in the enviable position of the man who has never had any trouble with his liver; he is hardly aware of the mere existence of such a thing. But, unlike the man with the liver, which after all may never go wrong, his enlightenment is bound to come when the "organ grinding" part of the business is over and the stern reality of the dark-room has to be faced.

For while it is one thing to develop a single snapshot upon a small glass plate or cut film, or even to tackle a dozen or more exposures from a roll holder, it is quite another to wrestle with a narrow strip of celluloid of 80 feet or upwards in length, bearing upon its surface a matter of twelve hundred separate latent images. For there is no such thing as cutting up the piece and developing the pictures one at a time—not that that sounds a very desirable consumption—and while all that length of sensitive surface must be developed and otherwise treated at the same time, each little picture of the



twelve hundred must be brought up to the same density as its neighbour, and the whole strip must present no stains or abrasions of the film.

Various are the methods by which this apparently superhuman task is brought within the capabilities of mortal man. At first sight it would seem that some form of winding mechanism—possibly similar to that in the taking apparatus itself—would reduce the matter to the range of practicability, but a little consideration will reveal the weak points of such a course. It will be sufficient to recall the fact that celluloid film coated with gelatine is not of a nature to be wound over itself upon a spool when the said gelatine is wet. The horror of tacking such a length of delicate and light-sensitive material, loose and uncontrolled, in a tub full of liquid, needs not the penning of a weird description to bring it home to the mind of the most daring man. Yet it is possible that for short trial pieces of film, at all events a series of large tubs, containing a plentitude of developer, alum, fixing salts, etc., the film being



drawn hand over hand from one to another, might not after all present insuperable difficulties to the careful operator.

But it is usual and probably very much wiser to employ one of the devices that experience has shown to be applicable to the case, and by whose help the dark-room manipulations are shorn of most of their terrors. One method, which is largely practised in America, is that in which the film is wound upon a huge drum before development, and retained thereon during that and all subsequent operations. The drum is pivoted at the centre and the film wound around it so that the various turns lie side by side, and not over one another as on a spool. Supposing that the periphery of the drum is wide enough to accommodate 10 turns of the film side by side—which is 15 inches without allowing for the small spaces which in practice are unavoidable—it would require rather over 8 feet in circumference, or, say, 1 yard in diameter, and allow a little for emergencies, to accommodate a film of average length. Another plan which finds more favour in England is that in which a cross-frame of peculiar construction is employed, and it has the advantage that it occupies much less space and is therefore more convenient to handle, and a

smaller quantity of developer is necessary while every portion of the film is beneath the surface of the solution during the whole operation of development. This last is a valuable consideration, for it at once opens the door to many developers that would be debarred by the other method on account of their easily oxidisable nature. The accompanying sketch will give an idea of the nature of this device. It will be seen that the cross is of the shape accredited to St. Andrew, and each of the arms is studded with a large number of perpendicular pegs of the same height as the width of the film to be wound upon them. The method of winding is just the reverse of that where the drum method is employed. Whereas in that case the film was wound in the form of a cylindrical spiral, in this it is in the form of a flat spiral like a watch spring. Practically the winding is the same as if it were upon its original spool, but each layer is separated from the next by four of the pegs. When the film is entirely wound upon the cross the whole thing is simply treated like a large photographic plate and submerged in the developer until the examination by transmitted light of any portion proclaims that the operation has been carried sufficiently far.

(To be continued.)

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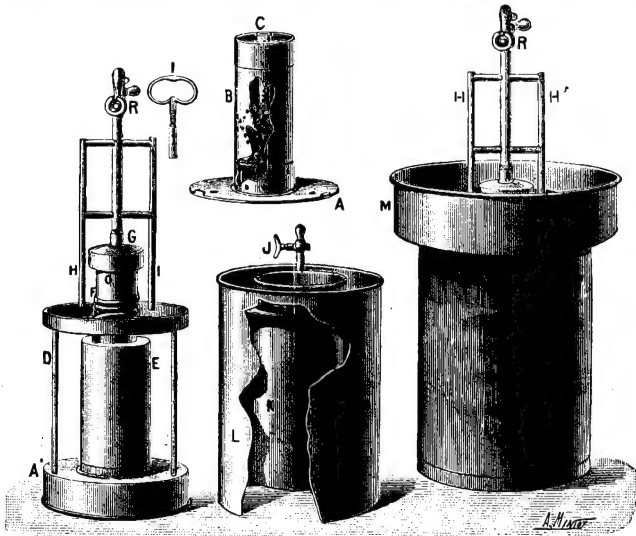


"COMPENSATOR" ACETYLENE GAS GENERATOR.

Mr. W. C. Hughes, of Kingsland, has taken up the agency for an acetylene generator of foreign invention termed the "Compensator," and has given us the opportunity of trying it over an extended period. This we have done, and now give a description of the apparatus itself and also its mode of behaviour. The gas is generated by means of water reaching the calcium carbide from below, so that as soon as water has reached the carbide the generated gas immediately drives the water back again until more gas is required. The gas is then led through a spiral pipe surrounded by water for cooling purposes towards the burners. When using gas formed in this manner, it is requisite to have some means of storing any

surplus gas that may be generated in excess of the burner capacity, and this is amply provided for in a peculiar manner, for as soon as the generating chamber is full of gas all overplus is sent automatically into the gasometer. This will, perhaps, be better understood on referring to the drawings, which are lettered as follows:—A, plate of calcium carbide holder; B C, carbide holder; D E, pipes for overflow gas from generator to gasometer; F, pipe for cooling the gas; G, screw connection; H H, guides for the gasometer; I, key for the tap R; K L, inner and outer sides of gasometer with exit tap at J; M, water tank. Carbide is placed in

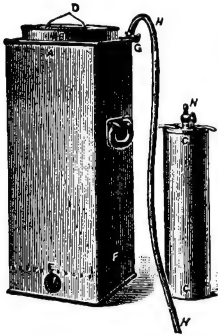
of which should be connected by a rubber tube of short length to the tap J, which tap can now be closed. In order to generate gas it is only necessary to insert the key I on the tap R, and give it a half-turn. The key, as stated, cannot now be removed. The confined air above the carbide will now pass out at the burners, which should be connected with the second tap above R, and in so doing the outside force of water allows the level of the water inside to rise; but on touching the carbide the internal pressure forces the water back again, and from now the generation becomes quite automatic in action, and passing through the spiral pipe R



the holder B, which is then inserted upwards into the appliance shown at left-hand figure, when it is secured in place by means of bayonet joints. The key I must now be left off the tap R, which ensures that tap being closed, as the key can only be taken off when it is so. All above the calcium chamber is now air-tight, so that when the apparatus is inserted in the tank M, which should be filled with water, no water will rise to the carbide until the confirmed air is liberated. The gasometer K L is now lowered into the water, the tap J being left open so as to permit of all the air being driven out as it sinks. Above what is termed the safety tap R are two taps with outlets, one

the gas becomes cooled. It may happen that the gas may be generated a little quicker than it is used, and in this case the gas-holder comes automatically into play; for when the water has all been forced out of the generator by reason of its being full of gas, the overplus goes up the tubes D and E into the gasometer of. As an example, to show the working of this, we will suppose the gasometer to be partly filled, and that it is wished to empty it. This is very simple. The tap R is closed, thus preventing the entrance of any water to the carbide holder, and the tap above R, to which the tubing from J had been attached, opened; thus establishing connection between the

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Can be recharged when lights are burning.  
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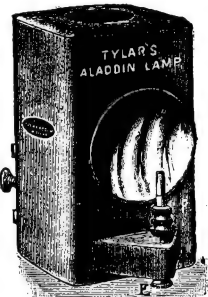
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EVERY LANTERN DEALER SHOULD STOCK THEM.  
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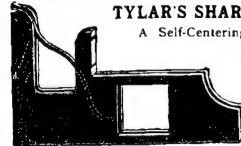
NO MORE OF THAT ABOMINABLE OIL  
FOR THE LANTERN,

With its attendant mess of filling, trimming wicks, etc., to say nothing of that vile smoke and smell.

I offer you a Substitute that gives a brighter light, that is less trouble to prepare for use, and that is better and cleaner in every way. It is acknowledged by all who have seen it to be the most compact and best thought out thing of its kind. Its small bulk, its absolute simplicity and safety at once commend it. It is so simple that a child can master and use it in five minutes. It is useful for the Lantern, for Enlarging by the Camera, for Reducing by the Camera, for Copying. It has any standard size of optical lantern, being the same width as an ordinary 3-inch oil lamp, and gives two hours' light at a cost of 2d.



Size, 7 x 4 1/2 x 5 1/2 inch.



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A Self-Centering Carrier for the Lantern allowing of Rapid Changing of Slides. Works smoothly and with absolute certainty.

Well made in solid mahogany.

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Catalogue, 250 pages, 400 Wood Cuts, post free, 6d.

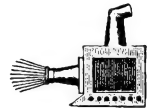
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For Limelight, Medical, Metallurgical, and other purposes.

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The public are respectfully informed that all Cylinders which are filled by the BRIN COMPANIES (whether their own or their Customers) are labelled with the Companies' Trade Mark. This label guarantees the purity of the Gas, and is a further guarantee that the Cylinder has been tested and proved sound in every respect by the BRIN COMPANY which has filled it. Customers who wish to procure BRIN'S OXYGEN are requested to see that the Cylinders supplied to them bear this label, which is also stamped with the date on which the Cylinder was filled.

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Price Lists of Gases, Cylinders, and all Accessories, can be obtained from the Company's accredited Agents, or will be sent Post free on application.

Addresses —  
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Works—69, Horseferry Road, WESTMINSTER, S.W.  
MANCHESTER OXYGEN COMPANY, Limited, Great Marlborough Street, MANCHESTER.  
BIRMINGHAM OXYGEN COMPANY, Limited, Saltley Works BIRMINGHAM.

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**HUGHES' GREAT MOTOR-PICTORSCOPE** for showing animated pictures. No shutter, therefore no flickering. 12 to 20 feet pictures. Perfection. Eclipses all others. No eyes ache, no headache as with most machines. The improvements in this are beyond description. It is most simple, and the result magnificent. A superb piece of mechanism.

**HUGHES' LIVING PICTURE PHOTO-ROSCOPE**, a little gem instrument; flickering reduced to a minimum, can be attached to any lantern, will give with oil 4 feet pictures; limelight, 10 to 14 feet pictures. Price with lantern complete, £13 1s. and £15 1s.; without, £9 9s. and £11 1s.; superior to many machines on the market costing £20 to £30 each.

**HUGHES' PHOTO-ROSCOPE PEEP SHOW**. The greatest money-taker of the 19th century; animated pictures in the open daylight at Seaside, Bazaars, etc. Measures 9 feet long. Twenty people can see at one time. Not a toy, but high-class. Price complete, with Photo-Rotoscope machine, £21 10s. Illustrated Catalogue of Cinematographs of above, 6d.

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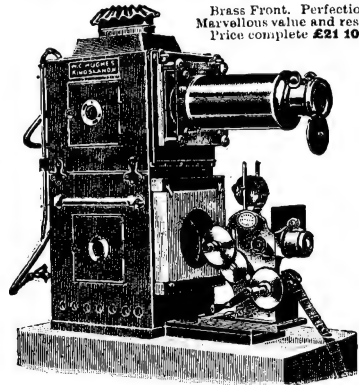
### Marvellous Pamphengos Magic Lantern. OVER 3,000 SLID.

The finest oil-lighted Lantern extant. Gives brilliant 12 to 14 feet pictures. No smell. No smoke. No broken glasses. 4-inch finest Condensers, and large front Lenses; elegant brass sliding fronts. The 26 6s. reduced to **£4 4s.** The 24 4s. reduced to **£3 10s.** Particulars free. The Universal four-wick Lantern, 18s. 6d. Marvellous value. Handsome brass-fronted Biunial Lanterns, £6 10s. Blow-through Jets, 8s. 6d. Mixed Gas ditto, 12s. Mr. Hughes has the Greatest Display of High-Class Projecting Lanterns and Effects the world has ever seen. The Docwa, the Grand and the Miniature Malden Triples. Superb instruments as supplied to Madame Patti, Professor Malden, Royal Polytechnic, etc. Before purchasing get Hughes' Grandly Illustrated Catalogue, 160 original engravings, price 6d., postage 3d. Giving valuable information. Illustrated Pamphlets, 2d.; Price List of 60,000 Slides, 4d., Postage 2d., beautifully coloured. Cheapest and Best Lantern Outfits in the World. 50 Slides loaned for 3s.

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### Photo-Rotoscope Cinematograph Biunial.

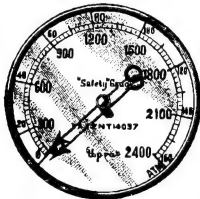
Brass Front. Perfection. Marvellous value and results. Price complete **£21 10s.**



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Approximately 2,000 Candle-Power. A Jet of Jets. A most penetrating white light, constructed on a new principle. Hemming's Safety. Perfected after exhaustive experiments. All screwed and cast. Mechanical movements. Price **£3 10s.**

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42/-  42/-

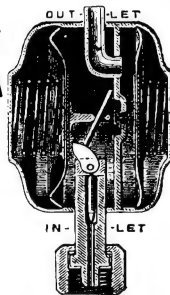
### Safety Gauge.

Cylinders filled with the Richest Oxygen made from Chlorate of Potash.

# Duplex

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BEST FOR  
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CINEMATOGRAPH EXHIBITIONS A SPECIALITY.

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## A. CLARKSON & CO.,

COMPRESSED GAS  
MANUFACTURERS.

28, BARTLETT'S BUILDINGS, HOLBORN CIRCUS, LONDON E.C.

gasometer and the burners. When emptied the tap can be closed and again opened, so as to admit water to the carbide chamber. The gasometer, we may mention, is guided on the rods  $\pi \pi$ . We find that the best quantity of carbide to use is exactly three-quarters of a pound, and this, with two Bray's burners each of 00000 size, gave a good and steady light for  $1\frac{1}{2}$  hours, and during that time there was no over-production of gas beyond the capacity of the gasometer. The two burners which we used carbonised a good deal, and it became necessary to remove the lump of carbon occasionally. There is one point, however, which, according to the instructions supplied by the makers, we do not agree with, and that is the claim that "when the tap  $r$  is turned off gas ceases to be generated, and the apparatus can be set away until required again." It is well known by users of acetylene that the moisture present in the lime below the carbide is sufficient to permit of the slow generation of the gas, and when trying this we found that the apparatus could only be stopped for about 20 minutes, as by that time sufficient gas had been generated to fill the gasometer. We are well pleased with the behaviour of this generator throughout, and consider that Mr. Hughes has a good thing in it, especially as the workmanship is excellent and all parts finished off in good style; in other words, the principle is good and the apparatus well made.

TITLE AND NOTICE SLIDES.

Mr. W. A. Winter, of Hatton Garden, who works exclusively for the trade, has introduced some excellent styles of slides for notices, lecture titles, and cinematographic announcements. The lettering, which is bold and plain, is contained within floral designs. Some new and startling designs of rackwork slides have also been brought out by Mr. Winter.

BRITISH LIME CYLINDER MANUFACTURING COMPANY.

At their well-fitted premises (51, Turnpike Lane, Hornsey, London, N.) a number of hands are employed in cutting, roughing, drilling, turning, and packing limes for the use of the lanternist. When entering the premises we were agreeably surprised to see that branch of lanternism catered for so extensively. We inspected lime in the rough, saw it brought into shape, and eventually tried some lime cylinders on our own jets, and found them to stand well and emit a pure white light.

VICTOR FIXING SALT.

This salt, for which Messrs. Fuerst Bros., 17, Philpot Lane, E.C., are agents, is intended to take the place of hypo for fixing. It quickly dissolves in water, negatives may be fixed without previous washing, and this does not discolour the solution. With pyro-soda developer and this fixing salt we obtained clear blackish negatives of great beauty without undue hardness. The proportions of this salt required for making a fixing bath are Victor fixing salt 2 ozs., water 25 ozs.

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The following List, relating to current Patent Applications, is compiled expressly for the "Optical Magic Lantern Journal" by W. P. Thompson & Co., Patent Agents, of 322, High Holborn, London, W.C., to whom all enquiries for further information should be addressed.

- | No.   | RECENT PATENT APPLICATIONS.   |
|-------|---|
| 3274. | 14th February, 1899. Arthur Freemore Spooner. Improvements relating to coin-rend and stereoscopic apparatus. (Eugene Hannan and Ernest Gauthier, France.)                   |
| 3285. | 14th February, 1899. Henry Abbey Brown. Improvements in and in means or apparatus for producing and exhibiting kinetoscopic and like pictures.                              |
| 3548. | 17th February, 1899. Matthew Wheldon Aisbitt, James Miller and William Jones. Improvements in lamps or lanterns.  |
| 3858. | 21st February, 1899. Victor Powers. Improvements in acetylene and like lamps and generators.  |
| 4024. | 23rd February, 1899. Alfred Miles. Improvements in or relating to apparatus for taking and exhibiting moving objects in motion.   |
| 4043. | 23rd February, 1899. Francois Joseph Bourgeois. Improved non-explosive acetylene lamp.  |
| 4141. | 24th February, 1899. Ladislaus Emanuel Granichstaden. Improved means and apparatus for exposing photographic and like views cinematographically.                            |
| 4164. | 25th February, 1899. Charles Swiers Lumley, Thomas Knight Barnard, and Frederick Gowenlock. Improvements in photo-chromostereoscopes, also applicable to cameras. Complete. |
| 4255. | 27th February, 1899. Francis Windham. Acetylene lamps.  |
| 4433. | 28th February, 1899. John Henry Stone. Improvements in lanterns and lamps and burners therefor.   |
| 4492. | 1st March, 1899. Henry James Thatcher. Improvements in or relating to binoculars or eyeglasses, spectacles and the like.  |

4601. 2nd March, 1899. Robert Williams Wood. Improvements relating to the production of coloured photographs, and to apparatus for viewing the same. Complete.
4603. 2nd March, 1899. James Harding-Lancaster. Acetylene gas lamps.
5085. 8th March, 1899. Alexander Hughes. Improvements in the construction of binocular glasses.
5221. 9th March, 1899. Edward James Dolan. Improvements in acetylene lamps.

## SPECIFICATIONS PUBLISHED.

Copies of the following specifications may be obtained by remitting 1/- for each specification to W. P. Thompson & Co., Patent Agents, 322, High Holborn, London, W.C.

- 25016 of 1898. Schwaes. Acetylene generators.
- 8054 of 1898. Moores and Farrell. Means for fixing or fitting incandescent electric lamps into lanterns.
- 2585 of 1898. Barnard. Means for obtaining uniform illuminations in microscopes or similar optical instruments.
- 9337 of 1898. Clark (the firm of Haas). Process of and apparatus for the production of grained glass plates or screens for photographic purposes.
- 27821 of 1897. Upward and Dalmer. Apparatus and mechanism for the display of inscriptions, pictures, and the like for the purpose of advertisement.
- 5037 of 1898. Parson and Bastian. Apparatus for producing vari-coloured effects with illuminated advertisements or the like.
- 9805 of 1898. Huet. Binoculars, telescopes, and other optical instruments in which it is desired to obtain a rectified image.

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*Novice.*—In fitting up your lantern in the manner suggested everything depends upon the size and make of the body, but presuming it is the average kind fitted for limelight you will scarcely find sufficient room in the lower, but if you happen to have the requisite space you might manage it as there is ventilation at the sides of the division. Used with the illuminant you desire you would have to dispense with a chimney, at least in the lower lantern. As far as the heat is concerned that will not hurt the upper light. Of course you would turn the lantern not in use down to the bye-pass. You will find information on all subjects pertaining to the lantern in our back numbers.

*G. H. Phelps.*—We have referred to the manuscript of the advertisement and find that we published it correctly in every particular. The advertiser intended letters to be sent to, etc., and you addressed it to Mr. Letters, etc. Possibly the postman asked for someone of that name. We addressed your envelope and forwarded it with our official stamp upon it and it has not come back, so we presume you will have heard from the party.

*H.H.*—There is no such box upon the market for lantern slides as that which you enquire about, but this make is used in conjunction with thin discs of much

larger size and for quite a different purpose. Some six weeks ago we made a rough sketch in our note book of a design like this taken from the large box we saw, and intended to suggest that it be made for lantern slides. We shall probably call attention to it in next issue of this Journal, and doubtless several makers will place such upon the market.

*R.T.*—To be candid in the matter, we do not think much of it. We would suggest that you yourself have never tried it practically; it simply will not work, although the theory part is very nice.

*E. A. Colborne.*—Thanks for the cutting, we get that particular paper regularly. We have heard of the same kind of explosion happening before, although not through such a length of piping. The generator contained an explosive mixture evidently brought about by filling it with air, the acetylene from the water forming an explosive mixture. This would blow through the small opening in pipe without danger so long as there was force behind it, but it appears the force was expended, that is, the bell container was down; the pipes thus contained an explosive mixture which fired back, which, under the circumstances, was to be expected.

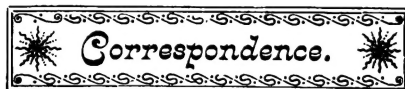
*Photophilus.*—(1) To work a triple in the manner you suggest would be impracticable. It would necessitate the expenditure of a great deal of money, and you would require a pantechinon van at least to cart the accumulators and other apparatus about. For the four lanterns the cost would probably be about £300, and would weigh something like six tons, and if the convenience were at hand for recharging this would cost a few pounds. We think these particulars will be sufficient to explain why your plan would be impracticable. (2) The lustrous surface is a decided disadvantage.

*A. J. Morton.*—You will find Anderton's silver faced screen preferable.

*Natloim Htuos.*—You do not send your name, hence we cannot publish your letter. True it is written on headed paper, but it does not follow that you are the person whose name is printed at top. Owing to the style of business indicated, it is probable that many hands are employed there, and you may be one. You do not give even the name of the party of whom you complain.

*Magnet, F. J. Scrimgeour.*—We are sorry we have again had to hold your articles over, but have entered them for next.

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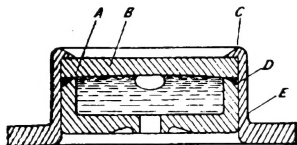
CAMBRIDGE SLIDES.

To Mr. J. Hay Taylor, Editor.

SIR.—Can any of your readers kindly tell me where I can get plain slides of the following buildings at Cambridge:—Downing College, Sydney College, Magdalene College, St. Catherine's College, the University Library, St. Benet's Church Tower? I have failed to obtain these, as none of them appear to be included in the ordinary sets.

Yours faithfully,  
(REV.) F. E. CAMERON.

Bonington Rectory,  
Hythe, Kent.



That indispensable adjunct to a hand-camera, the circular spirit level.—ARNEY.

The new design of

### Circular Spirit Level

shown here in section is a great advance on previous designs  
With every level we give a practical guarantee of durability.

Price 1/- post free,

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**TAYLOR, TAYLOR & HOBSON.**

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AND 18, BERNERS STREET, LONDON, W.

## SANDS, HUNTER & Co., Photographic Apparatus and Lanterns,

NEW AND SECOND HAND, BY ALL THE BEST MAKERS.  
Lanterns and Operator let out for evening entertainments for children, &c. Terms Moderate.  
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Photographic Apparatus, Scientific Instruments and every description of miscellaneous property.

M. R. J. C. STEVENS begs to announce that he holds Sales of the above, every Friday, at half-past twelve precisely, at his great Rooms, 28, King Street, Covent Garden, London.

Gentlemen wishing to include property in these Sales are requested to send particulars one week prior to sale.

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... ONE TRIAL WILL PROVE THIS FACT. ...

Send for Prices and Particulars to the Manufacturer of the  
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PECKHAM RYE, S.E.**

Lantern Slides of Historical Portraits and Events.  
15th, 16th, 17th and 18th CENTURIES.

SEND FOR LIST TO

**H. de BLOIS-LEACH & CO.,**

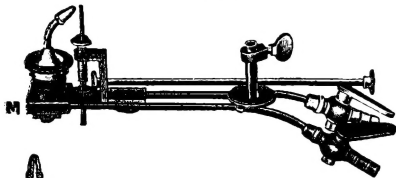
Lantern Slide Makers to the Oxford University Extension Lecturers  
**3, THE TURL, HIGH STREET, OXFORD.**

Slides made from Book Illustrations, Engravings, etc., on the shortest notice by the Collodion Process at 6s. 6d. each, cash with order.

# THE "INJECTOR" MIXED JET.

Patents 10,554 and 24,761/93.

PRICE 30s.



This is the only Mixed Gas Jet which will work at full power with coal gas taken direct from the town supply, and oxygen from a cylinder. In order to effect this the oxygen, on its way to the mixing chamber, is made to pass through the small Injector I in the sketch at a pressure of about 12 lbs. per square inch. In passing through the Injector it sucks a supply of coal gas from the pipe H, which is connected with the house pipe, and forces it forward through the short pipe T into the mixing chamber M. Here the mixed gases meet the baffle plate B, which has the two-fold effect of silencing the passage of the gases, and ensuring their complete admixture. The

mixed gases then pass through holes in the edge of the plate, and so to the burner. The requisite pressure of oxygen is obtained in the ordinary way by a fine tap on the cylinder, or an automatic regulator fitted with a high-pressure spring to deliver at about 15 lbs. pressure.

Four seasons' experience has fully established the superiority of this Jet over all others. It will yield **THE FULL 1,800 TO 2,000 CANDLE-POWER** (so-called) of the ordinary mixed jet when taking its supply of coal gas direct from the town's pipe, or even from a bag without any pressure at all. If a town's supply is not available, it will work just as well with coal gas from a cylinder. We cannot see why ordinary mixed jets should be purchased which cannot offer these alternatives. As for blow-through jets, we do not know why

they should be used at all, when with the same economy and convenience of working, the Injector Jet will give two or three times the light. By removing the Injector nipple the jet becomes an ordinary mixed jet. This can be done whenever it is desired to work with oxygen at low pressure, and coal gas from a cylinder.

The working of the Jet is simpler than that of an ordinary jet. When the H tap is once adjusted, it does not need to be touched again when using town's gas. The turning off or on of the oxygen supply regulates automatically the supply of coal gas. This is a great convenience in actual use.

Most existing jets can be fitted with an Injector to enable them to take their coal gas supply from the house pipe.

The Jet will in certain cases be sent on approval on deposit of purchase price. Further particulars free on application to

**MANCHESTER OXYGEN (Blin's Patent) CO., LTD.,**  
Great Marlborough Street, Manchester.

## A HIGH GRADE CAMERA

should be as perfect for hand use as with the tripod. It must combine the possibility of making carefully selected pictures, where posing and light can be controlled with the power of immediate action, when a suitable and effective lighting has to be quickly taken advantage of.

# THE No. 4 CARTRIDGE KODAK

is such a camera. It has a rapid rectilinear lens with iris diaphragm and pneumatic or trigger release to the shutter. It is readily opened, and is very compact and portable, measuring when closed, only  $3\frac{1}{2}$  inches in thickness. It is also provided with rack and pinion for fine focussing, and is thus equally adapted

## FOR HAND AND TRIPOD.

When carried in the hand it is unobtrusive, all fittings being sunk flush. The camera may be carried without a case. It is particularly suited for attaching to a cycle, for which purpose specially designed dust-proof cases, fitted with simple clamping arrangement for securing the camera to the cycle, are supplied. The No. 4 Cartridge Kodak takes a  $5 \times 4$  picture, the most useful all-round size, and is adapted

## FOR PLATES AND FILMS.

*Price, for film use only, £5 5s.*

Plate Holders and Adapters charged extra.

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